

a body passage extending from the inlet portion to the outlet portion along the longitudinal axis of the fuel injector;

an armature proximate the inlet portion of the body;

a cylindrical needle operatively connected to the armature;

a seat protruding from the outlet portion of the body; and

a swirl generator proximate the seat;

wherein the cylindrical annulus of the body includes an inner diameter that is greater than a diameter of the cylindrical needle so as to define the body passage, which maintains an operative relationship between the body and the needle.

Sub B3
A1
A2

3.(Amended) The fuel injector of claim 1, wherein the seat comprises a first surface exposed to the fuel passageway and a second surface exposed to an exterior of the fuel injector, the first surface being spaced from the second surface a defined distance along the longitudinal axis, the first surface having at least one cut-out configuration that extends for a fraction of the defined distance into an interior of seat.

6.(Amended) A fuel injector having a fuel inlet, a fuel outlet, and a fuel passageway extending from the fuel inlet to the fuel outlet along a longitudinal axis, the fuel injector comprising:

a body having an inlet portion, an outlet portion, and a body passage extending from the inlet portion to the outlet portion along the longitudinal axis;

an armature proximate the inlet portion of the body;

a needle operatively connected to the armature;

a swirl generator proximate the needle;

a seat protruding from the outlet portion of said body, the seat including a first surface exposed to the body passage and a second surface exposed to an exterior of the fuel injector, the first surface being spaced from the second surface a defined distance along the longitudinal axis,

~~(b)~~ the first portion having at least one cut-out configuration that extends from the first surface for a fraction of the defined distance into an interior of seat.

Sub B1
20.(Amended) A method of stabilizing temperature of a fuel injector in a direct injection application, the fuel injector having a body; an armature proximate an inlet of the body; a needle operatively connected to the armature; a seat protruding from the body; and a swirl generator proximate the seat, the method comprising:

providing the needle with a substantially uniform cross-sectional area; and selecting the body to surround the needle and form a body passage, the body passage maintains an operative relationship between the body and the needle;

Sub B2
wherein fuel in the body passage transfers heat from the body to the needle to maintain a minimum temperature gradient and to maintain an operative relationship between the body and the needle.

Sub C4
21.(Amended) The method of claim 20, wherein an average cross-sectional area of the body passage is less than 2.25 times the substantially uniform cross-sectional area of the needle.